

B) REMARKS

I. GENERAL

Claims 1-6 are currently pending in this application; claims 1 and 6 have been amended; and claims 7-11 are newly added. The issues in the Final Action are as follows:

- Claims 1-6 are rejected under 35 U.S.C. § 101 for not being directed to non-statutory subject matter;
- Claims 1-4 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Patent No. 6,205,403 to Gaiser (hereinafter *Gaiser*); and
- Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Gaiser* in view of Publication No. WO0151955 to Baigini (hereinafter *Baigini*).

In response, Applicant hereby traverses the rejections and requests reconsideration and withdrawal in light of the remarks contained herein.

EXAMINER INTERVIEW SUMMARY

On July 14, 2010, an in-person discussion was held between the Examiners, Krystine Breier and Jack Keith, and Applicant's representative, Huyen Luong (Registration No. 61,052). Applicant would like to express appreciation to the Examiners for their time and consideration in conducting the interview. Applicant respectfully submits this summary of the substance of the interview in accordance with M.P.E.P. 713.04.

During the interview, Applicant's representative presented reasons that the pending claims are directed toward statutory subject matter. Specifically, independent claim 1 satisfies the machine or transformation test, and in addition, it is not directed to an abstract idea. No agreement was reached regarding this issue.

II. CLAIM AMENDMENTS

Claims 1 and 6 have been amended; and claims 7-11 are newly added. Support can be found in the specification at, *e.g.*, original claims, and paragraphs [0015] and [0010]-[0021] of the corresponding U.S. Publication No. 2007/0140056. As such, no new matter has been added.

III. REJECTIONS UNDER 35 U.S.C. § 101

Claims 1-6 are rejected under 35 U.S.C. § 101 as being directed to non-statutory subject matter. Applicant respectfully traverses the rejection by explaining below that the claims are, indeed, directed toward at least one class of patent-eligible subject matter.

Claims 1-6 are directed to a “method” and therefore are considered process claims for the purposes of 35 U.S.C. § 101. The sole basis for the rejection of claims 1-6 are unpatentable under 35 U.S.C. §101 is that they allegedly fail to satisfy the machine-or-transformation test. *See* Fianl Action, pg. 4. As an initial point, Applicant disagrees with this contention. For example, claim 1, as amended, recites in part “said operators used to reconstruct the orientation of at least one geophone along at least one desired axis” Accordingly, the claims recite the output of the method can be used to reconstruct the orientation of at least one geophone along at least one desired axis. Thus, the claims at least meet the transformation test because the claims transform a particular article, *e.g.*, the input raw seismic data, to a different state or thing, *e.g.*, data that can be used to reconstruct the orientation of a geophone.

Under the “transformation” prong of the machine-or-transformation test, there is transformation with regard to electronic data when “the nature of the data has been changed such that it has a different function or is suitable for a different use” (emphasis added). *See* New Interim Examination Instructions For Evaluating Subject Matter Eligibility Under 35 U.S.C 101, August 24, 2009, pgs. 5-6. In this case, there is at least transformation of the input seismic data by the claims because the nature of the data has been changed such that it is now suitable for use in reconstructing the orientation of at least one geophone where it was not suitable as such in the raw input format. Therefore, Applicant respectfully requests that the rejection of record be withdrawn.

Moreover, the U.S. Supreme Court's recent decision in *Bilski v. Kappos* clarified that the machine or transformation test is not the sole test for patent-eligibility of processes under 35 U.S.C. § 101. As the Supreme Court explained in *Bilski*, 35 U.S.C. 101 specifies four independent categories of inventions or discoveries that are patent eligible: "process[es]," "machin[es]," "manufactur[es]," and "composition[s] of matter In choosing such expansive terms, . . . Congress plainly contemplated that the patent laws would be given wide scope" to ensure that "ingenuity should receive a liberal encouragement." The Supreme Court further explained that its precedents provide three specific exceptions to 35 U.S.C. 101's broad principles: "laws of nature, physical phenomena, and abstract ideas."

Because the Office Action does not provide any further reasoning or support for its rejection of claims 1-6 under 35 U.S.C. 101 (other than solely relying upon the machine-or-transformation test), the rejection cannot stand in light of the Supreme Court's decision in *Bilski* and current PTO guidelines. Specifically, the U.S. Patent and Trademark Office has provided instructions that various factors must be considered in determining patentability. *See* 75 Fed. Reg. 43925-43928 (July 27, 2010). Therefore, the rejection should be withdrawn.

Further, it has been recognized that method claims concerning seismic data processing recite statutory processes, *e.g.*, do not claim an abstract idea. *See In re Johnson*, 589 F.2d 1070 (C.C.P.A. 1978). In *Johnson*, the court recognized that "the claim when analyzed in its entirety still defines a process for producing a segment of a seismic trace, which is free from a multiple noise event, from a segment of the trace which includes the multiple noise event [I]t is clear that the claim as a whole defines a sequence of steps for operating upon a seismic data trace to produce a different, noise-free seismic data trace. [W]e . . . conclude claim 1 recites a statutory process." *Id.* at 1080. "Appellants do not assert a recitation of a formula or a method of calculation as a basis for patentability of the recited processes, and it is clear that any mathematical operations performed in practicing the processes are incidental to the recited series of steps whereby a seismic data record is analyzed and processed in a specific manner to produce and record a noiseless seismic data record." *Id.* at 1081.

Specifically, the claim 1 mentioned by the quoted portion of *Johnson* is set forth below:

1. A process for suppressing multiple events in seismic traces comprising the steps of:
 - a) comparing a first seismic trace segment with a second segment of the same trace to select that portion of the second segment which most closely resembles said first segment;
 - b) determining the degree of similarity between said selected portion and said first segment; and
 - c) extracting a part of said selected portion from said first portion, said part being a function of the degree of similarity between said selected portion and said first segment.

Id. at 1074.

Similar to *Johnson*, the pending claims do not recite a formula or a method of calculation as a basis for patentability of the recited processes. Any mathematical operations performed in practicing the processes are incidental to the recited series of steps to obtain the angle of gather of reflectivity. Accordingly, claims 1-6 are patentable because they are not directed laws of nature, physical phenomena, or abstract ideas. Therefore, Applicant respectfully requests withdrawal of the rejection of record.

IV. REJECTIONS UNDER 35 U.S.C. § 102

Claims 1-4 and 6 are rejected under 35 U.S.C. 102 (b) as being anticipated by *Gaiser*. Applicant respectfully traverses the rejection.

“A claim is anticipated *only if* each and every element as set forth in the claim is found, either expressly or inherently, described in a single prior art reference.” *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987) (emphasis added). Moreover, “[t]he *identical invention* must be shown in as complete detail as is contained in the . . . claim.” *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236 (Fed. Cir. 1989) (emphasis added). Because the hallmark of anticipation is prior invention, an anticipating reference must not only disclose all claim limitations within the four corners of the document,

but must also disclose those limitations arranged or combined in the exact same way as in the claim. *Net MoneyIn v. Verisign*, Opinion in Case Number 2007-1565, pp. 15-16 (Fed. Cir. October 20, 2008) (citing *Connell v. Sears, Roebuck & Co.*, 722 F.2d 1542, 1548 (Fed. Cir. 1983)). In view of the above, Applicant respectfully points out that the Examiner's rejections are not sufficient under 35 U.S.C. 102.

Independent Claims

Claim 1 recites "the seismic data being acquired by an omnitilt sensor having at least three geophone components with an angular orientation $\phi\psi$ " (emphasis added). Claim 7 recites a similar limitation. The Examiner appears to assert that the sensor in *Gaiser* is equivalent to the recited omnitilt sensor. See Final Action, pgs. 2 and 5. As can be best understood, the Examiner suggests because the disclosure of *Gaiser*'s indicates the orientation of its "three-component geophones" can differ from one station, such disclosure means its vertical geophone does not remain vertical. See *id.* at pg. 3. Applicant respectfully notes that the assertion is an incorrect interpretation of the disclosure of *Gaiser*.

Specifically, there is a particular distinction between the orientation of the vertical geophone of the "three-component (3C) geophone" and the orientation of the three-component geophone itself. One does not dictate the other, as explained by *Gaiser*. Particularly, *Gaiser*'s vertical geophone of the 3C geophone is "gimballed to remain vertical regardless of orientation of the [three-component] geophone case." See *Gaiser*, col. 1, lines 49-51. That is, "the orientation of [the 3C] geophone[] can differ . . . from one station to next" but the vertical geophone of the 3C geophone, and not the 3C geophone itself, remains vertical. The orientation of the 3C geophone can differ from station to station because "[c]urvature in the cable and, in some cases, uneven bottom surfaces, [which] can cause horizontal receivers to be out of alignment with their intended direction" (emphasis added). See *id.* at col. 1 line 67 to col. 2, line 3. This interpretation is further supported by *Gaiser*'s title and abstract – method for determining horizontal geophone orientation. Because the orientation of the vertical geophone of *Gaiser* is always known (it remains vertically fixed), it is only necessary to determine the orientation of the horizontal geophones of the 3C geophones.

Consequently, the vertical geophone of *Gaiser*'s 3C geophone is fixed and its orientation remains the same, *i.e.* vertical, regardless of the orientation of the 3C geophone which can vary. This is contrary to the claimed omnitilt sensor as the geophones of an omnitilt geophone or sensors are not constrained to any particular direction. That is, every geophone can be oriented with an angle relative to the vertical axis in the present invention, $\phi\psi$. As discussed, the vertical geophone of the three-component geophone of *Gaiser* does not have an angular orientation $\phi\psi$ relative to the vertical axis because it is always aligned with the vertical axis. Because *Gaiser* does not show "[t]he **identical invention** . . . in as complete detail as is contained in the . . . claim," it does not anticipate claims 1 and 7. *Richardson*, 868 F.2d at 1236 (emphasis added). Therefore, Applicant respectfully requests withdrawal of the rejection of record.

Moreover, claim 1 recites "wherein various data are isolated, through the estimators, depending on whether they correspond to propagation with reflection or with conversion by the seismic horizons," and claim 7 recites "isolating at least a segment of said data using said estimators, said isolation depends on whether said portion of said segment corresponds to propagation with reflection or with conversion by the seismic horizons."

Applicant respectfully points out that the Examiner's burden to establish a *prima facie* case for rejecting the claims, see *In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002) (stating, "the PTO bears the initial burden of presenting a *prima facie* case of unpatentability."). The Examiner cannot shift this burden of presenting a *prima facie* case by citing to practically the whole disclosure by *Gaiser*, *i.e.*, at column 1 and column 3, line 10 to col. 5, line 58, effectively asking Applicant to parse through the art in a quest for support of the Examiner's rejection. Consistent with the foregoing, the Rules require that "[w]hen a reference is complex or shows or describes inventions other than that claimed by the applicant, the particular part relied on must be designated as nearly as practicable," 37 C.F.R. 1.104(c)(2). Accordingly, Applicant requests that the Examiner specifically identify any disclosure relied upon when rejecting the claims.

In addition, the Examiner appears to rely on *Gaiser*'s mere mention of "P-wave refractions, P-wave and PS-wave reflections" in "first-break polarization analyses" to satisfy the claimed limitation of "wherein various data are isolated, through the estimators, depending on

whether they correspond to propagation with reflection or with conversion by the seismic horizons.” However, the disclosures of *Gaiser* do not include whether any data isolation is dependent on the propagation with reflection or with conversion characteristics. For example, *Gaiser* suggests that “P-wave refractions, P-wave and PS-wave reflections” are not relied upon to determine the orientation of the horizontal geophones, providing that “[g]iven the two components, S_x and S_y , θ is estimated from the direct arrival energy” and “the approach fits a sine/cosine curve to the total energy of the direct arrival, $E'_y(\theta)$. See *Gaiser*, col. 4, lines 31-34. A general disclosure that the “first-break polarization analyses” rely on “P-wave refractions, P-wave and PS-wave reflections,” without more, simply does not meet the strict requirements of anticipation.

Specifically, “[n]o doctrine of patent law is better established than that [for] a prior patent or other publication to be an anticipation[, it] must bear within its four corners adequate directions for the practice of the patent invalidated. If the earlier disclosure offers no more than a starting point for further experiments, if its teaching will sometimes succeed and sometimes fail, if it does not inform the art without more how to practice the new invention, it has not correspondingly enriched the store of common knowledge, and it is not an anticipation.” *In re Seaborg*, 326 F.2d 996, 997 (C.C.P.A. 1964). Because *Gaiser* does not “describe the claimed invention with sufficient precision and detail to establish that the subject matter existed in the prior art,” it does not anticipate claims 1 and 7. See *Verve LLC v. Crane Cams, Inc.*, 311 F.3d 1116, 1120 (Fed. Cir. 2002). Therefore, Applicant respectfully requests withdrawal of the rejection of record.

Dependent claims

As shown above, independent claims 1 and 7 include features that are not satisfied by *Gaiser*. Each dependent claim depends either directly or indirectly therefrom, and each dependent claim thus inherits all limitations of their independent claim. Thus, each of the dependent claims sets forth features and limitations not recited by *Gaiser*. It is respectfully submitted that the dependent claims are allowable at least because of their dependence from independent claims 1 and 7 for the reasons discussed above. Accordingly, Applicant respectfully

requests the withdrawal of the rejection of record. Moreover, the dependent claims set forth additional features making them patentable in their own right.

For example, claim 2 recites “the sensor furthermore including a hydrophone, the reference data for reconstructing a vertical geophone are derived from the data acquired by the hydrophone” and claim 8 similarly recites “wherein the sensor further comprises a hydrophone, said method further comprises the step of: deriving the reference data for sensor reconstruction of a vertical geophone from the data acquired by the hydrophone.” The Examiner relies on col. 1 and col. 3, line 10 to col. 5, line 58 of *Gaiser* to satisfy this limitation. Again, Applicant respectfully points out the Examiner is shifting his burden of establishing a *prima facie* case for rejecting the claims to Applicant. *See In re Glaug*, 283 F.3d 1335, 1338 (Fed. Cir. 2002). Accordingly, Applicant requests that the Examiner specifically identify any disclosure relied upon when rejecting the claims.

Regardless, Applicant respectfully points out that *Gaiser* does not show “[t]he *identical invention* . . . in as complete detail as is contained in the . . . claim[s].” *Richardson*, 868 F.2d at 1236 (emphasis added). Rather, *Gaiser*’s mention of a hydrophone is related to a four-component (4C) receiver but there is no mention in the methods of *Gaiser* employing any data recorded by the hydrophone in its calculations. *See Gaiser*, col. 3 line 60 to col. 4 line 35 (showing the horizontal orientation being determined from the “two horizontal geophones”). Also, as discussed above, *Gaiser* does not contemplate “reconstructing a vertical geophone” as recited by the claims because the orientation of its vertical geophone is always known. Accordingly, *Gaiser* does not disclose the limitation of reference data acquired from the hydrophone for reconstructing a vertical geophone. Therefore, Applicant respectfully requests withdrawal of the rejection of record.

V. REJECTIONS UNDER 35 U.S.C. § 103

Claim 5 is rejected under 35 U.S.C. § 103(a) as being unpatentable over *Gaiser* in view of *Bagaini*. Applicant respectfully traverses the rejection.

In rejecting claims under 35 U.S.C. § 103, the Examiner bears the initial burden of establishing a *prima facie* case of obviousness. *In re Piasecki*, 745 F.2d 1468, 1472, 223 USPQ 785, 788 (Fed. Cir. 1984). The Examiner cannot satisfy this burden through “mere conclusory statements; instead, there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness.” *KSR Int’l. v. Teleflex Inc.*, 127 S. Ct. 1727, 1741, 82 USPQ 2d 1385, 1396 (2007) (citing *In re Kahn*, 441 F.3d 977, 988, 78 U.S.P.Q.2d 1329, 1336 (Fed. Cir. 2006)). Only if this initial burden is met does the burden of coming forward with evidence or argument shift to the Applicant. *Piasecki*, 745 F.2d at 1472, 233 USPQ at 788. Thus, the Examiner must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the Examiner’s conclusion. Moreover, to support an obviousness rejection, “[u]nder § 103, the scope and content of the prior art are to be determined; differences between the prior art and the claims at issue are to be ascertained; and the level of ordinary skill in the pertinent art resolved.” *Graham v. John Deere Co. of Kansas City*, 383 U.S. 1, 15 - 17 (1966). Further, the Examiner must provide analysis supporting any rationale why a person skilled in the art would combine the prior art to arrive at the claimed invention, and “[such] analysis should be made explicit,” *KSR*, 127 S.Ct. at 1741.

As shown above, independent claim 1 includes features that are not satisfied by *Gaiser*. Claim 5 depends from claim 1 and thus inherits all limitations of claim 1. Thus, dependent claim 5 sets forth features and limitations not recited by *Gaiser*. *Baigini* is not relied upon to satisfy these limitations. Therefore, it is respectfully submitted that dependent claim 5 is allowable at least because of its dependence from independent claim 1 for the reasons discussed above. Accordingly, Applicant respectfully requests the withdrawal of the rejection of record.

VI. CONCLUSION

In view of the above, Applicant respectfully requests reconsideration and believes the pending application is in condition for allowance. Please charge a fee in the amount of \$1110 for a three-month extension of time and \$810 for the RCE to Deposit Account No. 06-2375 under Order No. HO-CGGV.P0007US/11006846 during the pendency of this Application pursuant to

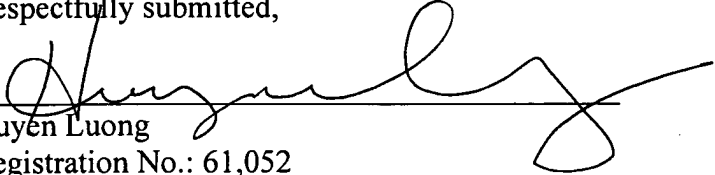
Application No.: 10/576,827

Docket No.: HO-CGGV.P0007US

37 C.F.R. 1.16 through 1.21 inclusive, and any other sections in Title 37 of the Code of Federal Regulations that may regulate fees.

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Respectfully submitted,



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Amendment Accompanying Request for Continued Examination

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the U.S. Postal Service as Express Mail, Airbill No. ER966259550US, on the date shown below in an envelope addressed to:
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Dated: August 19, 2010

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(Huyen Luong)